STATUS REPORT FOR THE FEDERAL REPUBLIC OF GERMANY
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It is a particular honour for me to present the German Government's Status Report to you this year.

Mobility – The Challenge For The Future

Transport integrates economic and living areas. In this age of globalisation, both citizens and our economy, which is based on the division of labour, are dependent on highly efficient mobility. The accessibility of the regions largely depends on there being high-quality infrastructures and an efficient transport industry and economy. For Germany, located in the centre of Europe, this is both a challenge and an opportunity.

We are currently already the no. 1 transit country in Europe. According to current predictions, there will be a large increase in distances travelled by 2015; this will be caused by a number of factors, including European integration and the eastward expansion of the European Union. These predictions estimate an increase of approx. 20% in passenger transport and of more than 60% in goods traffic. The key to coping with these enormous challenges is to have an integrated transport system which combines all modes of transport and utilises their specific advantages.

With 82.4 million inhabitants, Germany has the largest population in Europe. On 01.01.2002 there were 44,383,323 private cars in the Federal Republic of Germany. Compared with the previous year this constituted an increase of 1.4%. Further increases in the car population are expected in coming years. The average traffic volume for 2001 on the approximately 11,000 km of federal autobahns amounted to 48,400 vehicles per 24 hours. The total distance travelled by all motorised vehicles in 2001 was calculated as being 620.3 billion vehicle km; of these, 207.4 billion vehicle km were travelled on the federal autobahns and 108.2 billion vehicle km on federal roads outside built-up areas.

The most important prerequisite for coping with the traffic volumes is for our transport infrastructure to be modernised and expanded. Approximately 90 billion are to be invested in this area by the end of the decade as part of the Programme on the Future of Mobility. This will have a considerable effect on employment as approximately 24,000 jobs are secured during the building phase for every billion that are invested.

In addition to the considerable financial challenge which is faced, there is also an increase in the justified requirements that transport should be environmentally sound. It is not least for this reason that the Federal Government is aiming by 2015 to double the distance that goods travel on rail. This would correspond to an increase from approximately 20% of the total distance travelled in 1997 to over 24% in 2015. In order to achieve this aim, it will be necessary to improve the efficiency of rail transport and to have fair and comparable conditions of competition for the different modes of transport.

For this reason, investments in rail were brought into line with the high level of investment in roads, each now receiving approximately 4.6 billion per year.

The introduction of a distance-related fee for the use of autobahns by domestic and foreign lorries, which it is planned for August 2003, will also mean that there will be a fairer charge for transport infrastructure costs. Most of the revenue from the lorry toll will be earmarked for reinvestment in the transport infrastructure. First of all the revenue will be used for the Programme to Combat Traffic Congestion . Approximately 3.8 billion are to be invested in this programme between 2003 and 2007 to eliminate bottlenecks in rail, road and waterway transport.

We have also created the prerequisites for genuine competition in rail travel by ensuring that there is non-discriminatory access to the network for all operators. This will also provide impetus for attractive rail offers. In addition to this we also need cross-border, pan-European competition. This presupposes that the other EU Member States open up their rail transport markets and that technical harmonisation continues to be pushed ahead throughout the entire European rail transport system.

Innovative logistics concepts, in particular Combined Transport, which combines road, rail and inland waterway transport, will also play an extremely important role in reducing the strain on roads caused by goods traffic. Since 1998, the Federal Government has made a fivefold increase in funds for building new transhipment systems for Combined Transport and for improving existing systems; these funds now total 76 million per year. Funds totalling approximately 253 million have been provided for 39 systems so far.

State-of-the-art telecommunication and information technologies (telematics) such as traffic influencing systems on autobahns play an important role in

preventing traffic congestion, protecting the environment and improving traffic safety. Approximately 200 million are to be spent in the 2002-2007 Programme on Influencing Traffic on Federal Autobahns so that by the end of 2007 approximately 1200 km of autobahns will be equipped with influencing systems. Experiences so far have shown that the number of accidents was reduced by approximately 30%.

The project dealing with the development of a European satellite navigation system (Galileo) is of particular importance in this respect with regard to transport and industrial technology. It will open up many innovative possibilities for applying communication technology, particularly in the transport sector.

In order to ensure that we are in the long term able to maintain our high level of mobility, it will in future be increasingly important to balance the economic and ecological effects of transport.

Strategies For Road Safety

a) In the Federal Republic of Germany

In recent years, road safety work in the Federal Republic of Germany has been guided by two programmes on improving road safety:

- the programme "*Better Safe - Definitely Better - 10 Points for More Safety in Road Traffic*" from 1999 and following this;
- the "*Programme for More Safety in Road Traffic*" from 2001.

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Both programmes show targeted means and ways of protecting people's lives by preventing accidents, reducing the severity of accident consequences and bringing about sustainable reductions in socio-economic loss resulting from road traffic accidents, which at present amounts to a figure in the order of 35 billion .

The aim of the *Programme for More Safety in Road Traffic* is to improve and guarantee safety as mobility increases. Road safety work is one of the most important transport policy tasks in this regard. Increasing mobility is only accepted in our society if there is an increase in road safety and a tangible improvement in the general "climate" on the roads.

The traffic volume in the German transport system is expected to increase considerably in the future. For this reason the *Programme for More Safety in Road Traffic* provides for research into strategies for methods and technologies to improve the safety and flow of traffic operation and to guide and influence traffic. The aim of these measures is to better utilise existing infrastructure capacity and consequently improve sustainable mobility in private life as well as in the economic sector. The sustainability of mobility is an important factor for social development.

Decisions regarding road safety policies are made at many levels in Germany. The responsibility for safety in road traffic rests on many people's shoulders. The Road Safety Programme therefore calls upon all social forces to participate in improving road safety. The intention is also that the collaboration between the various private and state institutions should at the same time be improved in order to then together find goal-orientated solutions.

Five priorities were laid down to achieve the aims of the programme:

- improve the traffic "climate" in Germany in order to increase road users' composure and the consideration they show others;
- protect weaker road users, as children, older people and vulnerable road users in the broadest sense of the term, such as pedestrians, bicyclists and drivers of motorised two-wheelers, are at a comparatively greater risk in road traffic;
- reduce young drivers' level of accident risk, as the rate at which novice drivers between 18 and 24 years of age are involved in accidents is high;
- reduce the potential for danger presented by heavy goods vehicles, as traffic accidents involving heavy goods vehicles often have disastrous consequences due to the size and weight of the vehicles;
- increase road safety on rural roads, as these accidents usually have particularly serious consequences.

The *Programme for More Safety in Road Traffic* also encompasses more than 100 individual measures which are currently being implemented. Examples of these include:

- continuing to expand general traffic education;
- simplifying and expanding complicated rules and regulations;
- reinforcing the safety element in training;
- equipping all new vehicles with ABS;
- safety standards for roads;
- safety analysis of road networks;
- locating accidents more quickly.

b) International Measures Relating to Automotive Engineering

In the field of vehicle construction and performance standards, the incorporation of international regulations into national law makes an important contribution to traffic safety and environmental protection. The work as a member of the UN Economic Commission for Europe (ECE) and as a

Member State of the European Union (EU) are examples in this regard.

The following were concentrated on particularly in the last two years: the introduction throughout Europe of binding safety regulations for buses; the revision of regulations for indirect vision out of vehicles to avoid the so-called blind spot; and preparatory work on the binding introduction of standardised ISOFIX child restraint systems.

Accident Statistics

The number of road traffic accidents in Germany has decreased by approximately 1.7% compared with 1999, with approximately 2.37 million accidents occurring in 2001. The number of personal injury accidents decreased at the faster rate of 5,1 %, sinking to approximately 375,000 accidents. At the same time there was a reduction in distance travelled of 3.0 % to approximately 620 billion vehicle kilometres.

The number of traffic fatalities has decreased from 7,772 in 1999 and 7,503 (2000) to 6.977 in 2001 which is the lowest figure since 1953. In 1999 there were 4,640 fatally injured passenger car occupants, in 2000 this figure sank to 4,396, in 2001 there were 4,023 fatally injured car occupants. This corresponds to approximately 58 % of all persons killed in road traffic being car occupants.

Most of the personal injury accidents in 2001, approximately 64%, occurred inside built-up areas; the percentage of fatalities was significantly lower at approximately 25 %. In contrast to this, far fewer personal injury accidents occur on rural roads, the figure amounting to approximately 29%; the percentage of fatalities, however, is very high, at approximately 64 %. Approximately 6.9% of all personal injury accidents occur on autobahns; 11 % of all traffic fatalities occur in these accidents.

Accident Research

The Federal Ministry of Education and Research (BMBF) has been funding research and development projects to do with the improvement of safety in road traffic for many years.

The development and testing of modern sensor and control systems, of data-recording systems and of systems for communication, guidance and information technologies make it possible to provide road users and the traffic management system with up-to-date and complete information which was previously lacking. As a result, critical situations in traffic will in future be able to be recognised and avoided as they occur by means of advance warning and/or active support of the driver. This enables the risk of there being an accident to be considerably reduced.

The BMBF has funded the PROMETHEUS, BEVEI and MoTiV projects for this purpose, providing funds totalling approximately 200 million DM. Building on the results of its forerunners, MoTiV developed fundamental systems of this kind and tested them in demonstration vehicles with promising results; these vehicles provide drivers with effective support in such situations with regard to the selection of vehicle-to-vehicle distances and the choice of speed (Adaptive Cruise Control - ACC); they also warn drivers of potential conflicts with other road users during lane-changing manoeuvres and turning situations (turning and lane-changing assistance. Language-recognition methods which work reliably in the special conditions which exist in cars were also developed; these methods are equipped for future applications such as navigation, telematics and the Internet (man-machine-interface - MMI).

The project network entitled “The Safe Road“, which was brought to a close in 2002 with a concluding workshop, supplemented and expanded the work on improving active safety which was described above. This network concentrated on research activities aimed at better recognition and improved protection of vulnerable road users. An investigation was also made in this regard into the extent to which these vulnerable road users could themselves, at as little cost as possible, make a contribution to their own safety (VESUV). Another project investigated what form assistance systems should take to provide optimal support for the driver and how in particular it was possible to avoid excessive or insufficient demands being made of the driver (SANTOS, EMPHASIS).

The WARN project investigated a method for improving protection against rear-end accidents, in particular in conditions of poor visibility (fog, at bends, at crests in the road, etc.); this method consisted in using a vehicle-vehicle radio warning system over medium distances of 1 – 2 km in order to give a sufficiently early warning to the affected traffic coming from behind and if necessary to oncoming traffic as well. The system can be activated both manually (e.g. hazard warning lights) and automatically (e.g. through the release of the airbag).

The “Inter-Vehicle Hazard Warning“ (IVHW) project has built on the results of the above-mentioned WARN project; it comprises nine partners including the Federal Highway Research Institute (BASt) and is currently being brought to a successful conclusion. The project is part of DEUFRAKO (German-French Cooperation). The aim of the project was to jointly co-ordinate and evaluate the concept of a radio warning system based on vehicle-vehicle communication.

A research initiative which is currently being funded is the INVENT (Intelligent Traffic and User-friendly Technology) research initiative; one of the main areas it is concentrating on is the combined project entitled “Driver Assistance, Active Safety“ (INVENT FAS), which deals with the development of driver-assistance systems and has a total project volume of approximately 35 million for four years divided between five sub-projects. The cross-sectional projects "Recording the Driving Environment and Interpretation", "Driver Behaviour, MMI" and "Effect of Traffic, Law and Acceptance" support the two application projects: "Traffic Congestion Assistance" and "Predictive Active Safety" .

The sub-project "Traffic Congestion Assistance" is intended to build on the current ACC systems and develop a support system for congested situations which assists with both longitudinal and lateral guidance. Possibilities for improving traffic flow and operation by means of vehicle-vehicle communication are also to be investigated.

The sub-project "Predictive Active Safety" has four different target areas. The intersection assistance system is intended to implement right-of-way support functions when the vehicle approaches an intersection, provide protection against ignoring the right-of-way and against driving through red traffic lights and also implement assistance systems for turning onto and off roads. The aim of the lateral guidance assistance system is to enable protection to be given against coming off the roadway and against side collisions and to make avoidance and lane-changing manoeuvres safe. The integration of environment-sensor systems and novel passive and active safety systems is intended to increase the protection of bicyclists and pedestrians in the case of unavoidable collisions. In the area of predictive driving dynamics control systems, the aim is to use a combination of new environment-sensor systems and electronic stability programmes to improve the driver’s ability to keep to his lane when the vehicle stabilisation system has been activated, i.e. in situations in which the driver is no longer securely in control of the vehicle. The combined project “FAS” began in the summer of 2001 and will demonstrate initial results as part of a milestone presentation in the summer of 2003.

As well as the activities presented here which have already been running for a long time there is also a new combined project which aims to further improve safety in traffic tunnels in cases of accidents resulting in fires. Fortunately, accident-related fires in tunnels are a rare occurrence; recent events (e.g. the accidents in the Montblanc and Gotthard tunnels) do however show that there is definitely a need for action in this area on account of the tragic consequences of such accidents and the relatively high number of victims involved. In view of the fact that the number and average lengths of tunnels are increasing, the BMBF would like to support the development and testing of two new approaches to fighting fires in this area. These approaches aim to use suitable water-mist spray systems as well as the actual fire-fighting measures to bind smoke and harmful substances and consequently facilitate orientation and reduce toxic substances so that accident victims are able to be rescued or rescue themselves as safely as possible.

The Federal Minister of Transport, Building and Housing (BMVBW) has continued his many research efforts since the last ESV Conference in Amsterdam in June 2001; the BASt has played an important role in this research. Below are descriptions of the main activities in the areas of vehicle safety and the environment:

Passive Vehicle Safety

The surveys at scenes of accidents were continued. Some of the evaluations which were carried out in the last two years using these data were as follows: the potential for headlights that shine around the corner; improvement of vehicle safety using the front airbag as an example; details of pedestrian accidents; lorry accidents with cargo loss; accidents involving lorries turning right; effects of driver-assistance systems on accident occurrence; analysis of the impact points of car occupants’ heads in head-on collisions; injuries to the cervical spine; long-term consequences of injuries to the cervical spine; an analysis of critical points to optimise the emergency exit system in coaches; accidents with trams; accidents with pedestrians; and pelvic injuries.

As already reported at the 17th ESV Conference, a second team funded by the German automobile industry has been recording accident data since the middle of 1999 in the Dresden survey area. At present almost 1,000 accidents are recorded per year using the same methodology as in the Hanover survey area. The accident data of both survey areas are brought together in the joint GIDAS (German-In-Depth-Accident-Study) database. By the end of December 2001 this database contained a total of 5,000 accidents involving 8,700 vehicles and 7,000 injured persons.

Under commission to the Federal Minister of Transport, Building and Housing, the BASt is concentrating on its involvement in the currently active EEVC working groups. A detailed report on the state of the work will be given at another stage of this conference.

EEVC WG 12 is discussing the improvement of the existing dummy generation. The BASt has investigated the interaction of impact forces on the legs with forces measured in the pelvic area in

order to further develop the EuroSID side dummy. The EU Commission is funding further work on new side dummies in the SIBER project. The investigation results will also be incorporated into the IHRA's work and the development of WORLDSID. The FID project, which is funded by the EC Commission, in which the BASt is also involved, is pushing ahead the development and testing of a new front dummy to be used throughout the world.

By conducting several series of tests, the BASt has provided comprehensive support for the efforts of EEVC WG 13, which is revising the specifications for the deformation element to be used in side-impact crash tests. Additional certification test procedures were developed with extended specifications; these led to improved deformation elements, as comprehensive evaluation tests have shown. The proposals for improved and expanded certification test procedures have been presented to ECE Working Party 29.

EEVC WG 15 is carrying out investigations in the field of compatibility between cars in accidents. This study, in which all members of EEVC WG 15 will be involved, is intended to result in a proposal for a test procedure to evaluate the compatibility of cars in accidents. A preparatory study developed methodological approaches for the evaluation of accident data from in-depth accident surveys and for the evaluation of the potential benefit of good vehicle-vehicle compatibility. The first draft crash test procedures were investigated in crash tests.

As part of the work of EEVC WG 18, which aims to improve child restraint systems, the BASt is involved in the development of a new child dummy generation which can be used in head-on and side impact tests. Parallel to this the BASt is also involved in the CHILD (improvement of child restraint systems) research group which is funded by the European Commission.

In a research project the Technical University of Berlin developed an extended version of regulation ECE-R 44 which incorporated a side test procedure. This test procedure concentrates especially on simulating the intrusion of side structures. Another project is investigating whether side airbags represent a risk to children in child restraint systems. The findings are intended to be used to improve the existing regulations.

Mathematic simulation (virtual testing) is an aid for developing new vehicles quickly and cost-effectively which the vehicle and supply industry could no longer imagine doing without. The potential for "virtual testing" to be applied in legislation is shown by the fact that the EU Commission is funding the VITES project in which the BASt is also involved. The aim of the project is to investigate a possible extended application of mathematical simulation in legal regulations.

Serious injuries from airbags in accidents, which were reported recently in the USA, have not been observed in Europe. The high seat-belt wearing rates in Europe mean that the airbag is geared towards being used as an additional restraint system to prevent an occupant's head from colliding with parts of the vehicle interior. Its smaller volume can be inflated slowly and consequently less aggressively. The risk of injury is therefore low, even in 'out-of-position' cases. There have been a few reports of slighter injuries in less severe accidents and of faults in the release of the airbag. The ADAC Automobile Club and the General Association of German Insurance Companies (GDV) investigated these reports in a research project commissioned by the BASt.

The BASt is involved in EuroNCAP under commission to the German Government. Vehicle models are regularly tested in accordance with the Euro NCAP test protocols. The collaboration in all Euro NCAP management and technical bodies is intended to continuously improve the evaluation procedures, in particular by taking into account accident occurrence. In June 2002, at the launch of the test results of the tenth phase on the BASt's test site, about 40 crashed vehicles were presented to an international public.

Fires in coaches are a rare occurrence. The risk potential resulting from such occurrences is far greater than that for a car, as it can be assumed that a far larger number of persons will be affected. The construction of buses and coaches means that conditions for evacuating these vehicles can be expected to be far more difficult, in particular when vision is impaired due to smoke and there are panic reactions among the passengers.

This project presents existing national and European regulations and standards as well as showing possibilities for improvement with regard to the above-mentioned fire protection problems. Requirements in the railway sector are presented; these are tested to see whether they can be transferred to the coach and bus sector; also corresponding proposals made for determining judgement criteria, the derivation of limit values and the further development of test procedures are presented. The work has not yet been completed.

The GDV's Institute for Vehicle Safety concentrates mainly on the following fields:

1. Car safety – development of a new database, in particular on the subjects of driver-assistance systems, ESP, measures to reduce injuries to the cervical spine and child restraint systems.
2. Analysis of lorry/bus and van accidents.

3. Investigations into motorcycle and vehicle accidents was another main area.
4. Finally, the first phase of a project by European Insurers entitled "Quality Criteria for the Safety Evaluation of Cars on the Basis of Real Accidents", which was co-ordinated by the GDV, has been concluded and the second phase started.

As part of the "Vehicle Safety 2000+" project, the Institute for Vehicle Safety is drawing up a comprehensive and continuous accident database which already contains details of over 3000 recent accidents from the last three years.

A complete evaluation of the approximately 1,000 lorry accidents with severe personal injuries which occurred in Bavaria in 1997 was completed in 2001. The evaluation included an analysis of the car/lorry-front/head-on collisions; these are regarded as particularly dangerous, half of all fatally injured car occupants resulting from such accidents. It was seen that energy-absorbing front-end underride protection on lorries has the potential to reduce the number of seriously injured car occupants by at least 40 % and the number of fatally injured occupants by at least 11 %.

An estimation of the benefit provided by ESP (Electronic Stability Programme) was carried out in 2001. This analysis showed that up to 9 % of severe lorry accidents could be positively influenced or even prevented from occurring; with regard to cars, there would be an expected potential effect of 25%.

The international group "IIWPG" (International Insurance Whiplash Prevention Group) has been set up; the Institute for Vehicle Safety participates in this group which is intended to implement at global level the demands expressed by insurers for greater protection of vehicle occupants against cervical spine injuries.

A new observation and survey study on the securing of children in cars was completed in 2001 and produced a series of new findings supplementing the study's forerunner from 1995.

Although two thirds of the observed children in child restraint systems (KSS) were not correctly secured (installation errors and/or errors in securing the child in the KSS), the percentage of serious faults in the use of the systems had been almost halved since 1995.

The GDV supports ISOFIX, a fixed plug-and-socket connection between car and KSS, with which errors during installation can be largely prevented.

With regard to the subject of "pedestrian protection", GDV accident research compiled representative accident material from 1200 cases, which showed that the head-on collision is the main area of pedestrian accident occurrence.

According to investigations so far, the most severe injuries are located in the head area if the pedestrian collides with the windscreen, its frame or the A pillar.

The "SARAC" project (Safety Rating Advisory Committee), which is funded by the European Commission, was completed in 2001 under the co-ordination of the Institute for Vehicle Safety and under commission to the European Insurers (CEA). This project provided a detailed description of existing methods for analysing real accidents as regards the safety evaluation of cars and investigated the statistical calculation processes used in these methods. In a further step, an analysis was made of correlations between results from NCAP crash tests and results from real accidents arrived at by SARAC. Finally, approaches were drawn up on how aspects of vehicle compatibility and vehicle aggressiveness could be incorporated into future rating procedures so that partner protection was also taken into account.

A follow-up project entitled SARAC II will also deal with the subjects of active safety and pedestrian protection.

Active Vehicle Safety

Car braking signals have hitherto only shown a car driver that the person driving in front of him is applying his brakes. The signals do not, however, provide any information on how sharply the person is braking. One of the causes of rear-end accidents could therefore be that the danger posed by sharp braking is not recognised early enough.

A research project by the BASt investigated how rear car signals could be optimised, in particular to show dangerous braking separately.

It was seen that, depending on the respective situation, two measures were basically suitable for attaining benefits, i.e. reducing a driver's reaction time or increasing the rate at which adequate deceleration is achieved when the drivers is reacting to a dangerous braking manoeuvre:

- an increase in the area and luminance of the stop lamps is intuitively recognised by the following drivers as meaning that they are drawing closer to the vehicle ahead;
- flashing lights are particularly suited for attracting the attention of the following driver to the braking vehicle, even when he is distracted.
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Building on these results the BASt proposed the following further development of the rear signal: when a braking assistant or ABS is applied or when a car decelerates at over 7 m/s², the dangerous braking manoeuvre is indicated by the high mounted stop lamp flashing at 3 – 5 Hz. There should also be the option that the areas and luminance of the two lower stop lamps increase. This proposal is currently being discussed internationally. The introduction of such a signal system for dangerous braking would require amendments to ECE regulations no. 7 and no. 48 and to the Vienna Convention.

The European Commission Recommendation of 21st December 1999 to the Member States and industry on safe and efficient on-board information and communication systems (European statement of principles) urges competent agencies and the vehicle and supply industries to observe the principles regarding the design of the man-machine interface.

The Member States were called upon by the EU Commission to report on the measures taken by themselves and by industry to ensure that the principles were observed and to report on the results of an evaluation assessing the extent to which the Recommendation was being observed.

The Federal Highway Research Institute drew up a report for this purpose; it comments on the extent to which the Recommendation is being observed voluntarily and states whether further – in particular legislative measures – are necessary.

The results were as follows; these also constitute the main foundation for the Statement by the BMVBW to the EU Commission:

- random investigations discovered no evidence that the vehicle manufacturers and suppliers of vehicle parts and equipment for the original fittings in the Federal Republic of Germany were not voluntarily observing the principles stated in the Recommendation;
- the procedures which were applied to evaluate the man-machine interface correspond to state-of-the-art research;
- there still remains considerable need for research concerning the available methods for the ergonomic evaluation of the man-machine interface and their scientific basis;
- there is need for research and action regarding the potential for misusing information and communication systems;
- service-providers throughout the EU should be incorporated into the EU Recommendation as a target group. The award of RDS (radio data system) licences should be linked to the commitment to observe standard EN 50067 and the EU Recommendation; provision must be made for suitable conventional penalties;
- there is clear need for making the Statement of Principles more precise concerning the combination of several systems in the course of retrofitting;
- the principles should continue to have the status of a Recommendation;
- apart from this there is at present not thought to be any general need to take further measures, in particular legislative measures, with the exception of a regulation regarding the installation of retrofitting devices;
- the market must be observed in the future – nationally and throughout the EU – in order to be able to identify cases which impair safety and if necessary to be able to react to these.

In contrast to vehicles with parallel sets of wheels, the locking of any wheel on a motorcycle creates unstable driving conditions which are directly linked to a danger of overturning and falling. The use of either an automatic lock-preventing device or a specified distribution of braking power represent a clear improvement compared with standard brakes. Using both systems together leads to additional gains in safety.

The “Better braking“ motorcycle safety campaign was launched in 2001 under the auspices of the Federal Minister of Transport, Building and Housing; over 100,000 persons were contacted via this campaign. The brakes which are on the market today mean that the motorcycle rider is subjected to excessive technical and mental demands in surprise and emergency situations. For this reason the GDV calls for motorcycles to be fitted with an anti-locking system as standard.

It has, however, not yet been possible to develop an anti-locking system for motorcycles which is suited for bends. A braking system such as this, which also guaranteed driving stability in bends, could eliminate riders’ fear of sharp braking manoeuvres and bring about far better levels of deceleration. An ABS system for motorcycles which was suited for bends would have to work continuously, without the pulses known from car systems, as the rider has to support himself almost exclusively with his arms. Consideration must also be given to the torque forcing the motorcycle upright and the steering torque which influence the motorcycle as it leans into a curve and the brakes are applied.
The BASt is currently having an investigation carried out in a project into how the risk of critical braking situations can be reduced in the case of motorised two-wheelers.

The "light vehicle" category was newly introduced in Germany in accordance with Directive 92/61/EC. The four-wheel vehicles have an unladen weight of less than 350 kg, not including the mass of any batteries which may be required, with a maximum speed determined by their construction type of 45 km/h. Light vehicles do not have to be licensed and consequently are also not subject to any technical monitoring. The BASt is examining in a research project whether technical monitoring should be obligatory for light vehicles for traffic safety reasons.

In future, an increasing number of vehicles will be equipped by the manufacturer with tyres with emergency running properties (run flat tyres), in order to be able to do without a spare wheel. In addition to reducing vehicle weight and saving on the spare wheel there is also the advantage that the vehicle can continue to be driven even after pressure in a tyre has been lost, which as a result means that the risk of the driver changing a tyre in moving traffic is eliminated. The aim of one of the BASt's projects is therefore to carry out handling tests to investigate the dynamics of a vehicle equipped with run flat tyres, both with and without vehicle dynamics control systems. The investigation is also intended to produce findings on the fatigue strength of the tyres.

The "Speed Alert" Working Group was launched on the initiative of ERTICO in August 2001; its objective is to co-ordinate and prepare a European strategy for the implementation of speed information and speed warning systems in vehicles (in-vehicle speed alert systems). The BASt is involved in these projects.

In view of the continuing spread of in-vehicle driver-assistance and driver-information systems, the question of information management, i.e. co-ordinating the functions of several systems in the vehicle, is becoming increasingly important. The main aims of the EU project COMMUNICAR, in which the BASt is involved as a partner, consist in the determination of drivers' information requirements and the definition of support functions geared towards these requirements; these functions take into account driver strain resulting from the traffic conditions when providing in-vehicle information.

The aim of the EU project entitled "ADVISORS" was to support the development, testing and implementation of driver-assistance systems and consequently to contribute to an increase in road safety and driving comfort and a reduction in environmental pollution. The BASt was involved in this project which was completed in November 2002. The findings gained in the evaluation studies formed one of the foundations for the development of implementation scenarios and strategies for selected driver-assistance systems which were discussed with international experts. The clear favourite was an integrated driver-assistance system, which contains functions to support speed control, the distance from the vehicle in front, and navigation.

e-Safety is a joint initiative of the EU Commission and the automobile industry; it aims to increase road safety through the use of intelligent information and communication technologies. The background to this is the EU Commission's "White Paper" on European transport policy (September 2001) and the aim formulated in it of reducing the number of accident fatalities by 50% by the year 2010. The EU Commission and industry have great expectations of the e-Safety initiative from an economic point of view as well.

The national opinion-forming process in Germany is being co-ordinated by the BMVBW with support by the BASt. Further expert discussions are planned; it is intended that concrete positions should be drawn up in these discussions regarding the recommendations of the e-Safety Working Group.

The BMVBW supports all innovations which have a clearly positive effect on road safety (e.g. 24 GHz radar panorama view; systems to provide direct driving support such as keeping to one's lane and maintaining vehicle-vehicle distance).

Electronic assistance systems must not prevent the driver from being able to act responsibly (e.g. no forced external control of the vehicle).

Suitable technical precautions must be taken to combat the misuse of electronic systems (e.g. visual use of the Internet while driving).

Environmental Protection Through Vehicle Engineering

2001 saw the launch of a combined project by the Federal Ministry of Education and Research and the Federal Ministry of Transport, Building and Housing; the project consisted in 15 different companies from various branches and institutions working on a joint project aim, namely the reduction of tyre/roadway noises.

The combined project is part of a project entitled "Quiet Traffic", the aim of which is to reduce noise pollution for the population which is caused by rail, air and road traffic. For the first time representatives of the road construction industry, the vehicle industry, the tyre industry, research institutions and universities are all working together on this joint research objective. The project is being co-ordinated by the BASt and includes work on

optimising roadway surfaces and the methods of laying them, optimising tyres and vehicles and new test procedures as well as implementing the mathematical simulation of the tyre-roadway contact. The results will be presented at the end of 2003.

In 2002, the results of COST Action 334 “Effects of Wide Base Single Tyres and Dual Tyres“ were presented to the public on the occasion of a workshop in Delft which was part of the 7th International Conference of Heavy Goods Vehicles Weights and Dimensions. With the support of the EU, researchers from various European countries have been working for four years on the question of the influence which different tyres on heavy goods vehicles have on rut formation, driving safety, environmental pollution and operational costs and how the costs/benefits are to be evaluated. Particular attention was paid to the effects of a new development by the tyre industry: wide base super single tyres on the driving axle of heavy goods vehicles.

A report on the results will be given during this conference in the “Safety of Heavy Trucks, Buses and Truck Tyres“ session.

It is intended that European Union Directive 2001/43 EC (the Tyre Noise Directive) should be extended by laying down procedures and limit values for the rolling resistance of tyres and the non-skid properties of tyres in the wet (from 2003). Under commission to the Netherlands, Great Britain and Germany, the TÜV Automotive GmbH (TÜV Süddeutschland) proposed a procedure in which a tyre collective is put forward as a reference to evaluate the non-skid behaviour of a test tyre in the wet.

Some current motorised two-wheelers are among the vehicles with the highest emissions of harmful substances, relative to the distances they travel. In contrast to cars, for which a periodic exhaust emissions test is required by law, motorised two-wheelers are not subject to any binding exhaust emissions tests once they have been licensed for traffic. This also applies with regard to the noise emissions.

In view of this, preparations are at present underway for introducing an environmental test for motorcycles.

In the UN-ECE Expert Group on Pollution and Energy (GRPE), discussions are currently being held in the “WMTC“ (World-wide Motorcycle Test Cycle) Working Group on a new, globally harmonised test cycle for measuring emissions of harmful substances from motorcycles as part of the type approval test. The new exhaust emissions certification cycle for motorcycles is intended to represent the operating conditions which occur in real traffic better than the ECE cycle which is currently applicable.

The GRPE has set up a sub-working group on hybrid vehicles. Germany has declared itself willing to participate in this ad hoc working group. The aim is to adapt already existing ECE regulations for motorised vehicles with combustion engines to take sufficient account of the particular technical properties of (electro-) hybrid vehicles – i.e. of vehicles which have two different transducers and two different energy storage systems for the purpose of propelling the vehicle. It is a priority in this regard that Regulation ECE-R 83 (Provisions for Determining Emissions of Harmful Substances) and Regulation ECE-R 101 (Provisions for Determining Carbon Dioxide Emissions and Fuel Consumption) are revised.

Accident Rescue

In the past there have been numerous novel developments in the construction of buses. These advancements will be investigated to find out how compatible they are with the aim of "suitability for emergency rescue". An analysis of critical points was carried out to optimise emergency exit systems; its objective was to investigate the bus constructions and the newly developed requirements concerning the structural strength of coaches and to derive criteria for an optimised emergency exit system (performance specification). The findings are intended to be used for the further development of the current regulations (e.g. ECE).

The emergency rescue services in the Federal Republic of Germany are a public-law health care system organised by the Federal States on a statutory basis. They comprise land-based rescue facilities and a nationwide network of over 50 rescue helicopters. The services are available around the clock throughout the entire federal territory.

In 2000/2001 the rescue services were used 10.3 million times, 57% of which were for the transportation of sick persons and 43% of which were for emergencies (with and without an emergency doctor). This corresponds to an average rate of every 9th inhabitant using the emergency rescue services once a year. The number of cases where the rescue services are accompanied by an emergency doctor is increasing. In 1985, 32% of all emergencies involved an emergency doctor; in 2001 this figure was 47%. The arrival time – this is the time from the emergency being reported to the arrival of the rescue services at the scene of the emergency – was 6.9 minutes during the day for traffic accidents within built-up areas and 7.1 minutes during the night. Every 16th emergency response was for a traffic accident. Twenty years

ago, 27.1% of all the times the emergency services were used were for traffic accidents; in 2001 this figure sank to 6.1%.

The papers by the German automobile industry are to be found in the various technical seminars.

We will continue to support the development of this important vehicle safety conference and provide corresponding contributions to it.